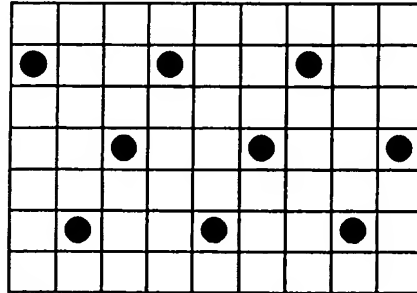


*Fig. 1(A)*

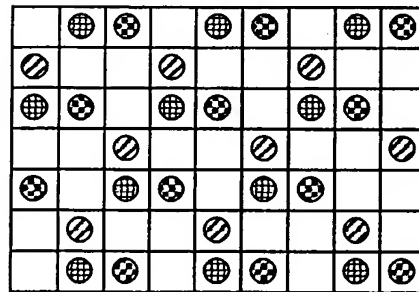
GRAY COLOR AREA REPRODUCED BY BLACK INK



● : black ink dot

*Fig. 1(B)*

GRAY COLOR AREA REPRODUCED BY COMPOSITE BLACK

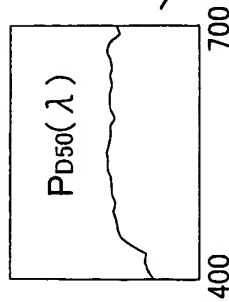


⊗ : cyan ink dot

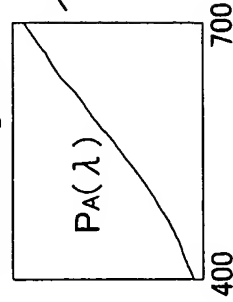
⊗ : magenta ink dot

⊗ : yellow ink dot

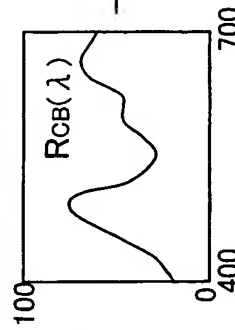
**Fig. 2(A)**  
SPECTRAL DISTRIBUTION  
OF SUNLIGHT  
(standard light D50)



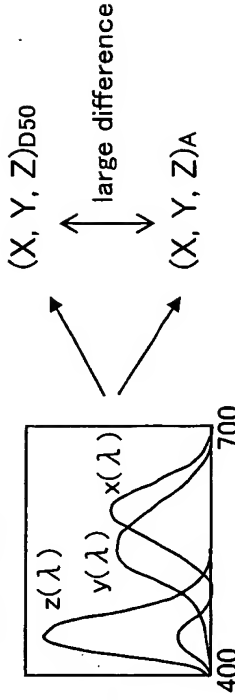
**Fig. 2(B)**  
SPECTRAL DISTRIBUTION  
OF INCANDESCENT LAMP  
(standard light A)



**Fig. 2(C)**  
SPECTRAL REFLECTANCE  
OF GRAY AREA PRINTED  
WITH COMPOSITE BLACK



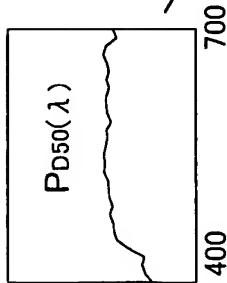
**Fig. 2(D)**  
COLOR-MATCHING  
FUNCTIONS



tristimulus values  $X, Y, Z$   
 $X = k \int P(\lambda) \cdot R(\lambda) \cdot x(\lambda) d\lambda$   
 $Y = k \int P(\lambda) \cdot R(\lambda) \cdot y(\lambda) d\lambda$   
 $Z = k \int P(\lambda) \cdot R(\lambda) \cdot z(\lambda) d\lambda$

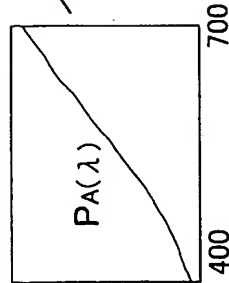
**Fig. 3(A)**

SPECTRAL DISTRIBUTION  
OF SUNLIGHT  
(standard light D50)



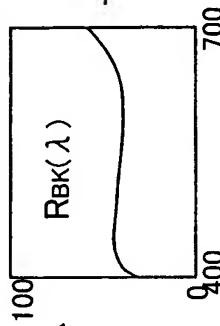
**Fig. 3(B)**

SPECTRAL DISTRIBUTION OF  
INCANDESCENT LAMP  
(standard light A)



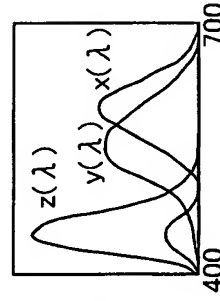
**Fig. 3(C)**

SPECTRAL REFLECTANCE  
OF GRAY AREA PRINTED  
WITH BLACK INK ALONE



**Fig. 3(D)**

COLOR-MATCHING  
FUNCTIONS



$(X, Y, Z)_{D50}$   
 $\longleftrightarrow$  small difference  
 $(X, Y, Z)_A$

tristimulus values  $X, Y, Z$   
 $X = k \int P(\lambda) \cdot R(\lambda) \cdot x(\lambda) d\lambda$   
 $Y = k \int P(\lambda) \cdot R(\lambda) \cdot y(\lambda) d\lambda$   
 $Z = k \int P(\lambda) \cdot R(\lambda) \cdot z(\lambda) d\lambda$

Fig. 4

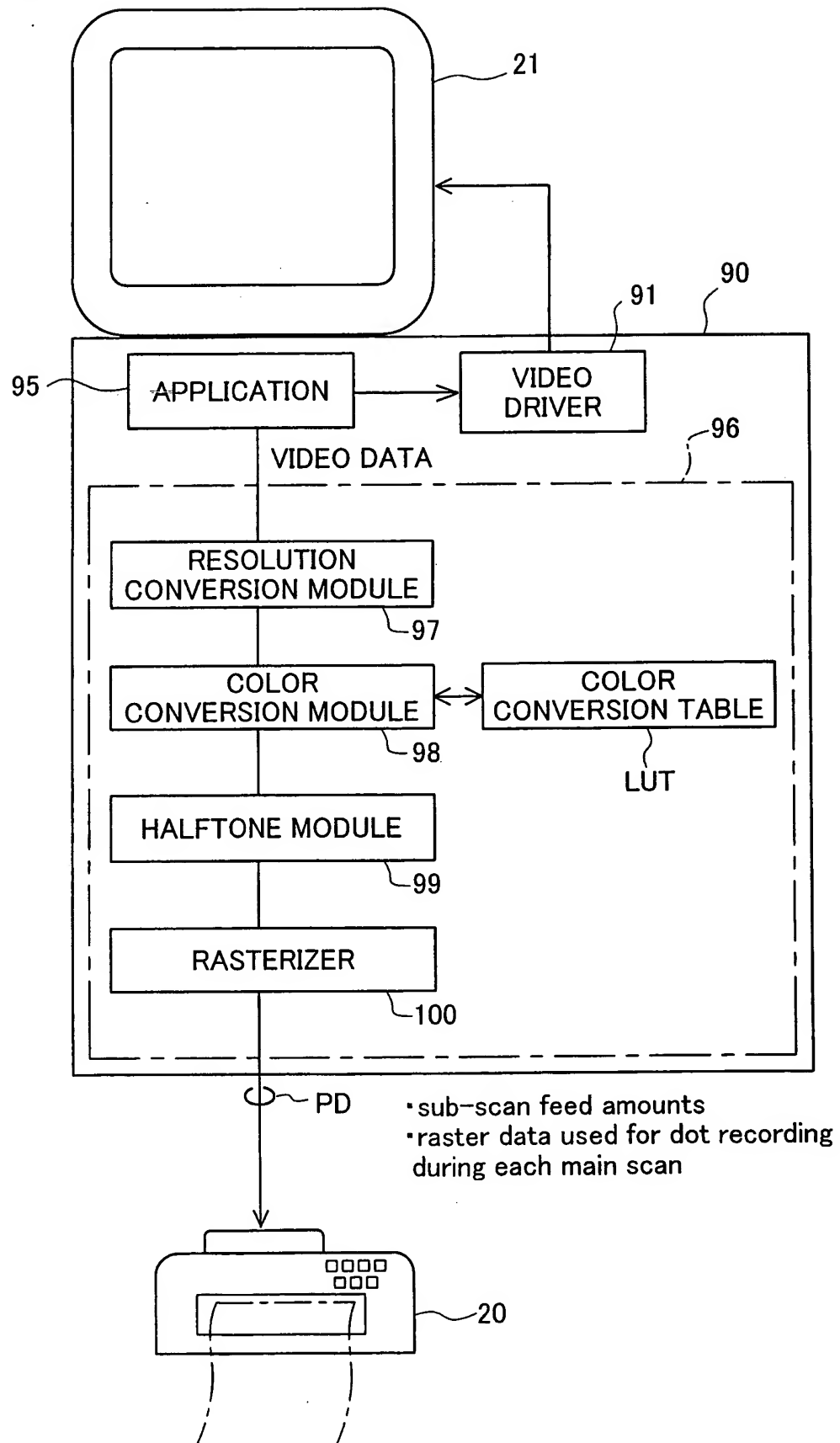


Fig. 5

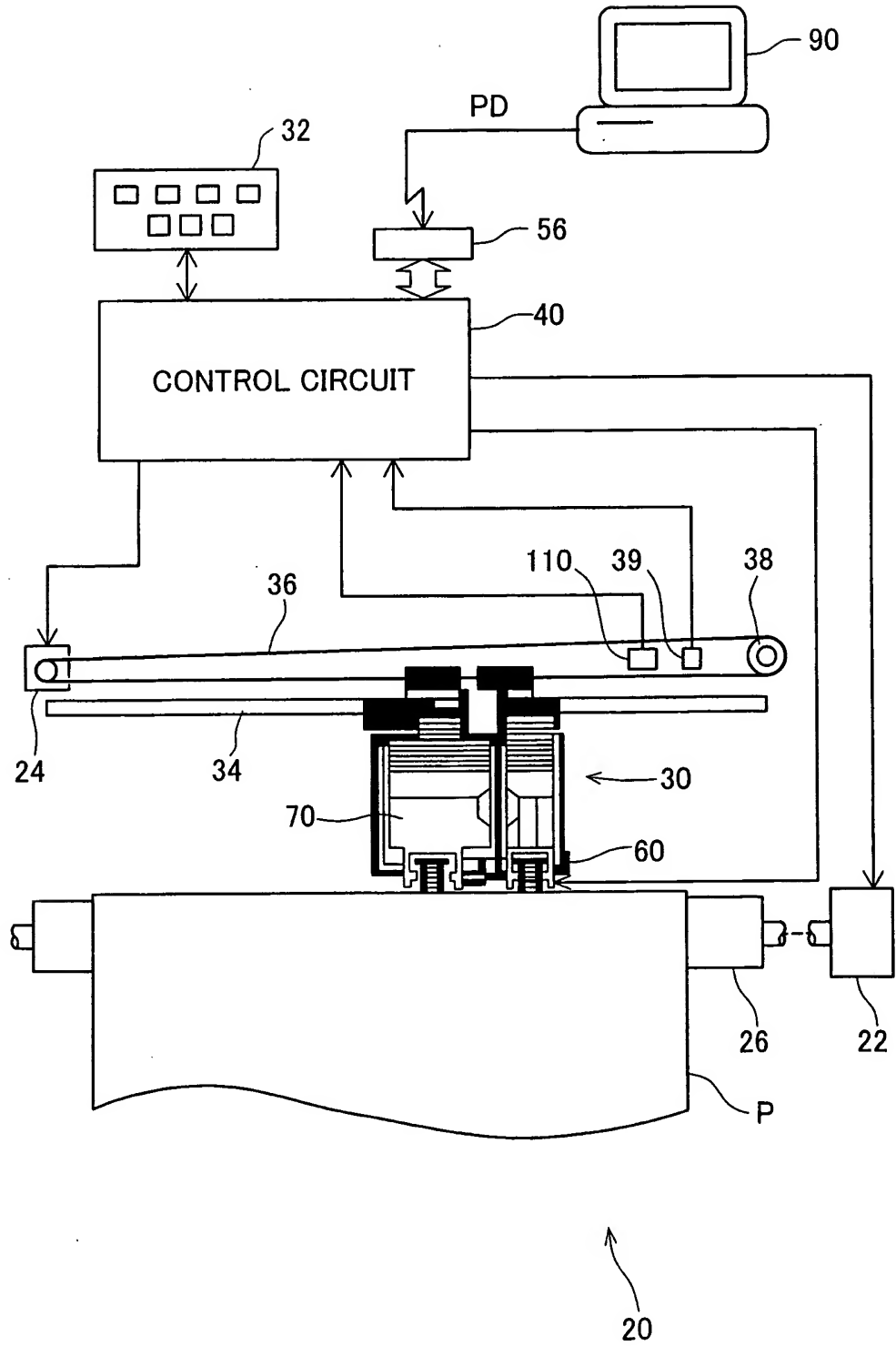


Fig. 6

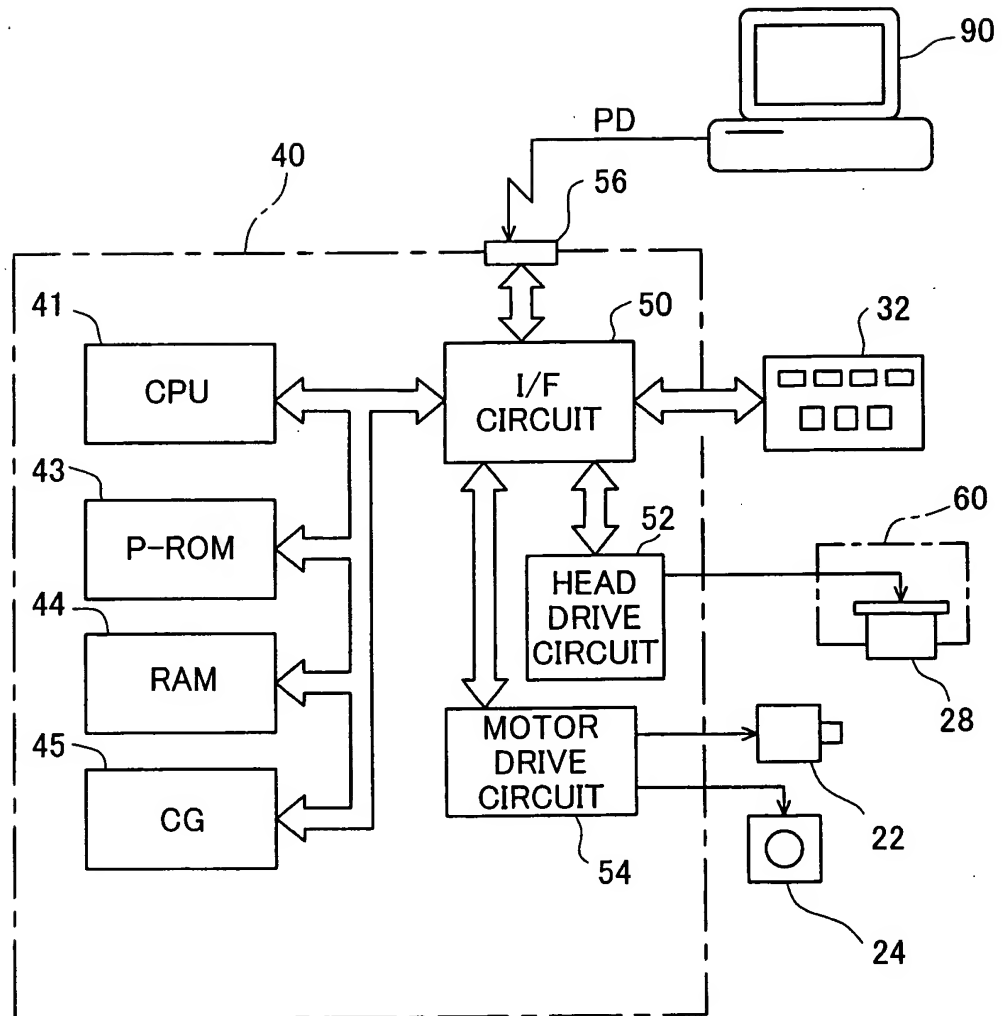


Fig. 7

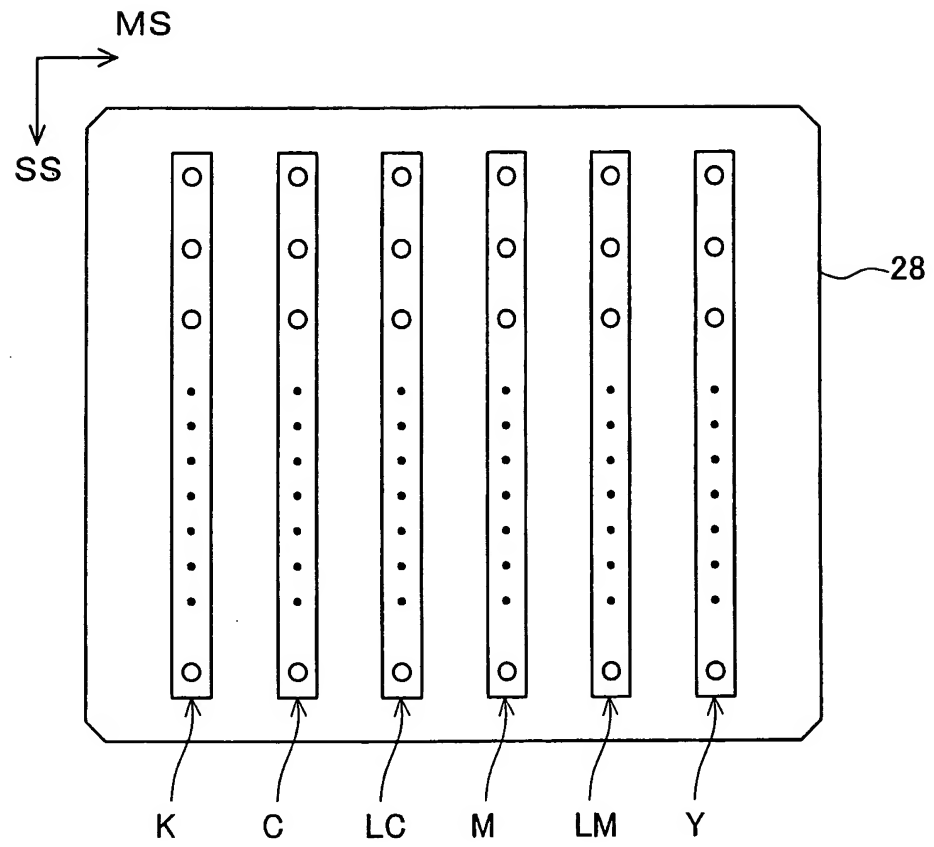
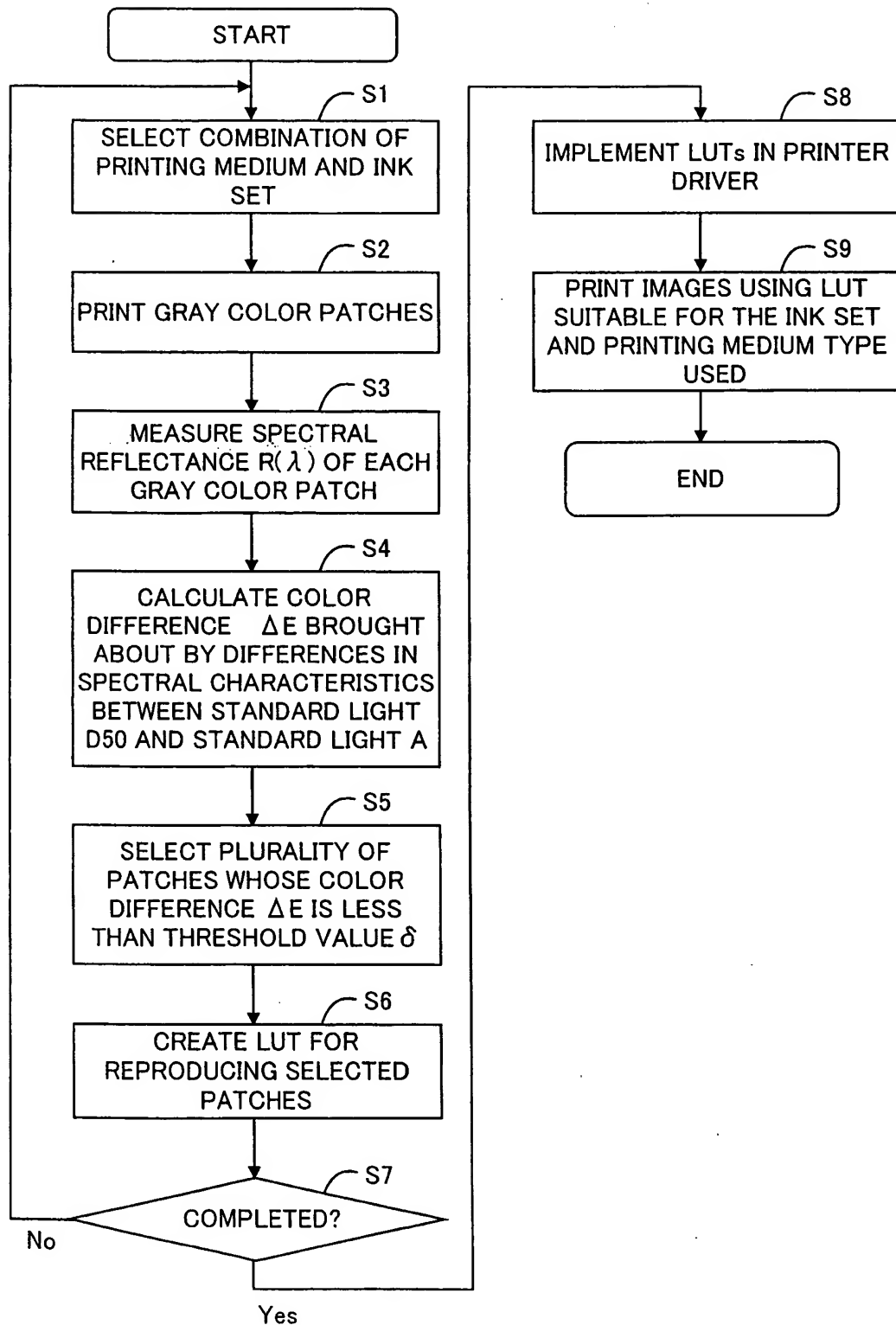


Fig. 8





## GRAY COLOR PATCHES

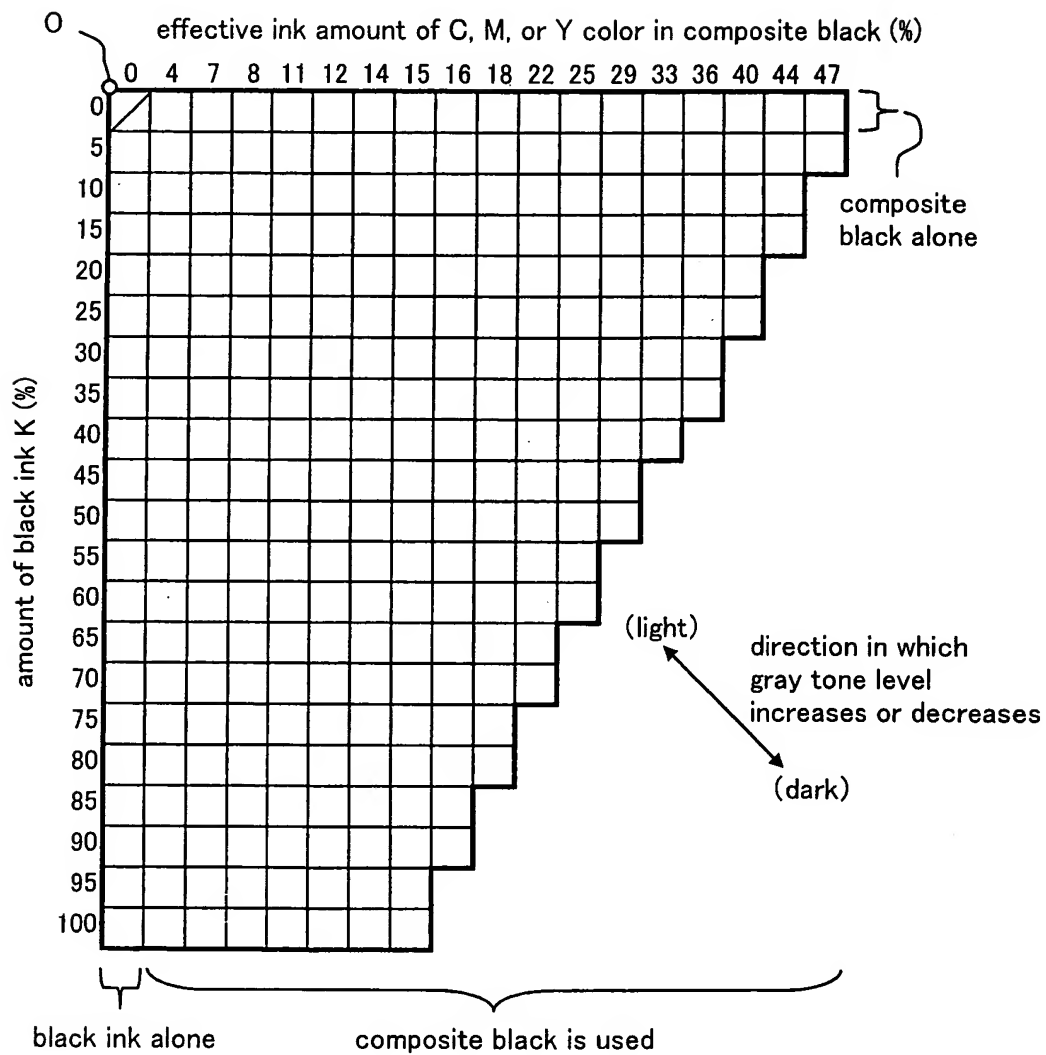
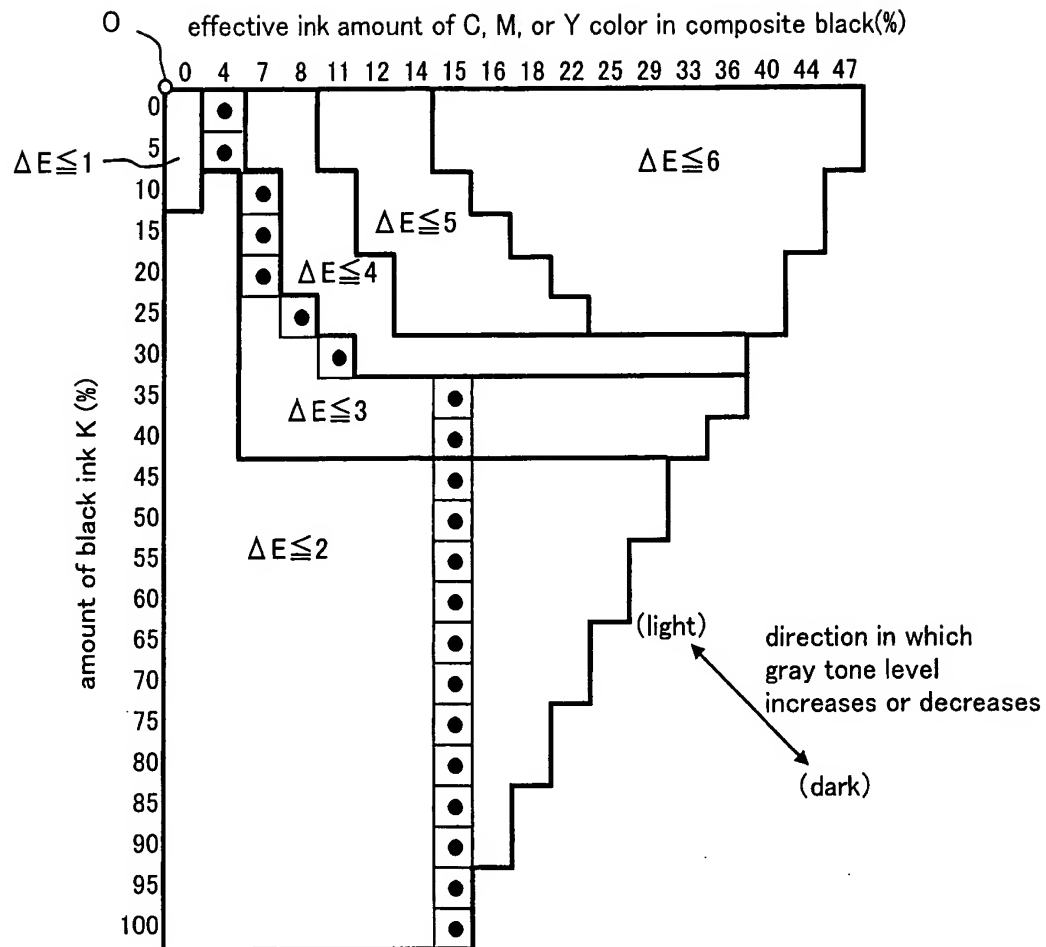


Fig. 10



$\Delta E$ : color difference due to difference in spectral characteristics between standard light D50 and standard light A

● : patches used for actual gray color reproduction (threshold value  $\delta$  of color difference  $\Delta E$  is equal to 3)

Fig. 11(A)

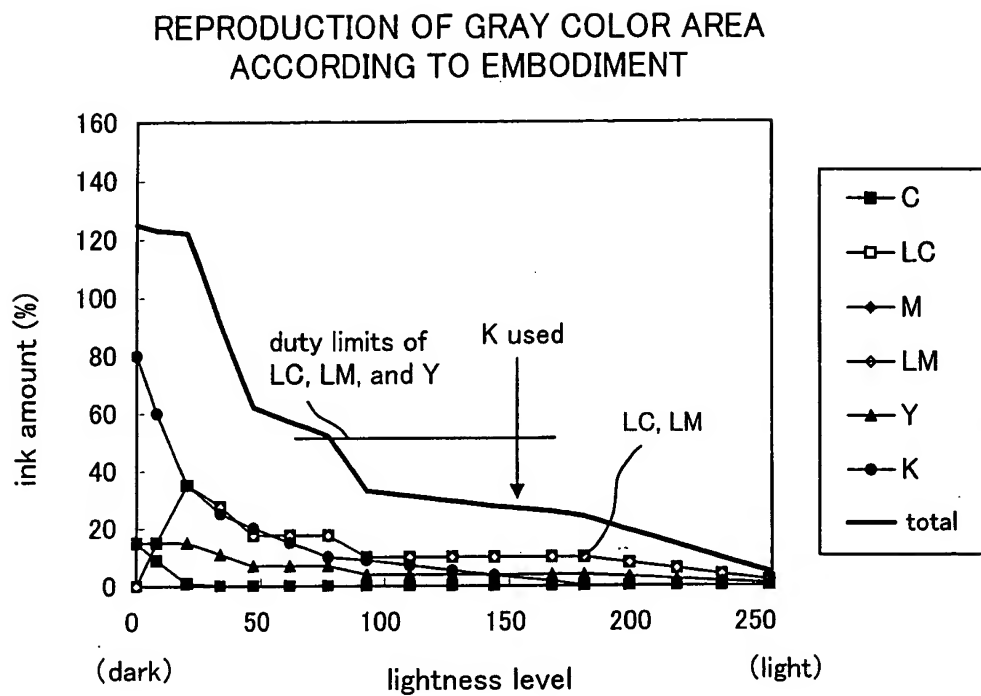
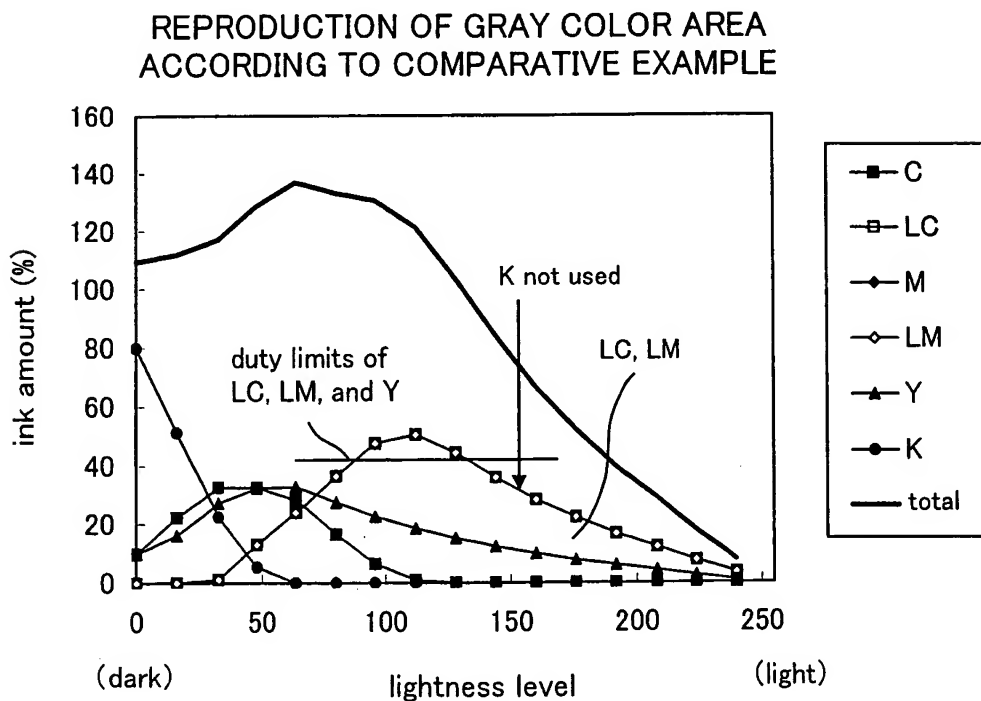
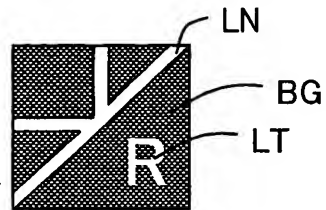


Fig. 11(B)



*Fig. 12(A)*

TEST PATTERN EXAMPLE FOR  
DETERMINING INK DUTY LIMIT  
(without bleeding)



*Fig. 12(B)*

TEST PATTERN EXAMPLE FOR  
DETERMINING INK DUTY LIMIT  
(with bleeding)

